CLAIMS

What is claimed is:

1. A synthetic peptide immunoreactive with hepatitis A virus (HAV) antibodies wherein the peptide comprises an antigenic epitope of the major structural capsid polypeptides or non-structural polypeptides of HAV with one or more molecules of the amino acid glutamine at the carboxyl end of the peptide.

2. The synthetic peptide of Claim 1 wherein the antibodies are IgM antibodies.

3. The synthetic peptide of Claim 1, wherein the antigenic epitope comprises both an antigenic portion of the amino acid sequence of the VP4 protein of the HAV polyprotein and an antigenic portion of the amino acid sequence of the VP2 protein of the HAV polyprotein.

4. The synthetic peptide of Claim 3, comprising one or more amino acid sequences selected from the group consisting of SEQ ID NOS: 1-10 and conservative variations thereof.

5. The synthetic peptide of Claim 3, wherein the peptide binds to an antibody specifically immunoreactive with one or more peptides having an amino acid sequence selected from the group consisting of SEQ ID NOS: 1-10 and conservative variations thereof.

6. The synthetic peptide of Claim 1, wherein the antigenic epitope comprises an antigenic portion of the amino acid sequence of the VP3 protein of the HAV polyprotein.

7. The synthetic peptide of Claim 6, comprising one or more amino acid sequences selected from the group consisting of SEQ ID NOS: 11-22 and conservative variations thereof.

8. The synthetic peptide of Claim 6, wherein the peptide binds to an antibody specifically immunoreactive with one or more peptides having an amino acid sequence selected from the group consisting of SEQ ID NOS: 11-22 and conservative variations thereof.

9. The synthetic peptide of Claim 1, wherein the antigenic epitope comprises an antigenic portion of the amino acid sequence of the VP1 protein of the HAV polyprotein.

10. The synthetic peptide of Claim 9, comprising one or more amino acid sequences selected from the group consisting of SEQ ID NOS: 23-38 and conservative variations thereof.

11. The synthetic peptide of Claim 9, wherein the peptide binds to an antibody specifically immunoreactive with one or more peptides having an amino acid sequence selected from the group consisting of SEQ ID NOS: 23-38 and conservative variations thereof.

12. The synthetic peptide of Claim 1, wherein the antigenic epitope comprises an antigenic portion of the amino acid sequence of the P2A protein of the HAV polyprotein.

13. The synthetic peptide of Claim 12, comprising one or more amino acid sequences selected from the group consisting of SEQ ID NOS: 39-48 and conservative variations thereof.

14. The synthetic peptide of Claim 12, wherein the peptide binds to an antibody specifically immunoreactive with one or more peptides having an amino acid sequence selected from the group consisting of SEQ ID NOS: 39-48 and conservative variations thereof.

15. The synthetic peptide of Claim 1, wherein the antigenic epitope comprises an antigenic portion of the amino acid sequence of the P2B protein of the HAV polyprotein.

16. The synthetic peptide of Claim 15, comprising the amino acid sequence set forth in SEQ ID NO: 49 and conservative variations thereof.

17. The synthetic peptide of Claim 15, wherein the peptide binds to an antibody specifically immunoreactive with a peptide having the amino acid sequence set forth in SEQ ID NO: 49 and conservative variations thereof.

18. The synthetic peptide of Claim 1, wherein the antigenic epitope comprises an antigenic portion of the amino acid sequence of the P2C protein of the HAV.

19. The synthetic peptide of Claim 18, comprising one or more amino acid sequences selected from the group consisting of SEQ ID NOS: 50-61 and conservative variations thereof.

20. The synthetic peptide of Claim 18, wherein the peptide binds to an antibody specifically immunoreactive with one or more peptides having an amino acid sequence selected from the group consisting of SEQ ID NOS: 50-61 and conservative variations thereof.

21. The synthetic peptide of Claim 1, wherein the antigenic epitope comprises an antigenic portion of the amino acid sequence of the P3A protein of the HAV.

22. The synthetic peptide of Claim 18, comprising one or more amino acid sequences selected from the group consisting of SEQ ID NOS: 62-65 and conservative variations thereof.

23. The synthetic peptide of Claim 18, wherein the peptide binds to an antibody specifically immunoreactive with one or more peptides having an amino acid sequence selected from the group consisting of SEQ ID NOS: 62-65 and conservative variations thereof.

24. The synthetic peptide of Claim 1, wherein the antigenic epitope comprises an antigenic portion of the amino acid sequence of the P3B protein of the HAV.

25. The synthetic peptide of Claim 24, comprising the amino acid sequence set forth in SEQ ID NO: 66 and conservative variations thereof.

26. The synthetic peptide of Claim 25, wherein the peptide binds to an antibody specifically immunoreactive with a peptide having an amino acid sequence set forth in SEQ ID NO: 66 and conservative variations thereof.

27. The synthetic peptide of Claim 1, wherein the antigenic epitope comprises an antigenic portion of the amino acid sequence of the P3C protein of the HAV.

28. The synthetic peptide of Claim 27, comprising one or more amino acid sequences selected from the group consisting of SEQ ID NOS: 67-72 and conservative variations thereof.

29. The synthetic peptide of Claim 27, wherein the peptide binds to an antibody specifically immunoreactive with one or more peptides having an amino acid sequence selected from the group consisting of SEQ ID NOS: 67-72 and conservative variations thereof.

30. The synthetic peptide of Claim 1, wherein the antigenic epitope comprises an antigenic portion of the amino acid sequence of the P3D protein of the HAV.

31. The synthetic peptide of Claim 30, comprising one or more amino acid sequences selected from the group consisting of SEQ ID NOS: 73-88 and conservative variations thereof.

32. The synthetic peptide of Claim 30, wherein the peptide binds to an antibody specifically immunoreactive with one or more peptides having an amino acid sequence selected from the group consisting of SEQ ID NOS: 73-88 and conservative variations thereof.

33. A method of detecting the presence of Hepatitis A virus (HAV) in a human or animal, comprising,

incubating an antibody-containing sample with one or more synthetic peptides immunoreactive with HAV, wherein the peptide comprises an antigenic epitope of the major structural capsid polypeptides or non-structural polypeptides of HAV with one or more molecules of the amino acid glutamine at the carboxyl end of the peptide,

and wherein the binding of the synthetic peptide with the antibody indicates the presence of HAV.

34. The method of Claim 33, wherein the synthetic peptide comprises an amino acid sequence selected from the group consisting of SEQ ID NOS: 1-88 and conservative variations thereof.

35. The method of Claim 33, wherein the synthetic peptide further comprises a label.

36. A method for detecting the presence of antibodies against hepatitis A virus (HAV) in mammalian serum, comprising

contacting one or more isolated, immunogenic HAV peptides of the present invention with antibodies from mammalian serum and detecting the formation of complexes between the immunogenic peptide and the antibodies, wherein the detection of peptide-antibody complexes indicates the presence of HAV.

37. The method of Claim 36, wherein the immunogenic HAV peptides comprise an amino acid sequence selected from the group consisting of SEQ ID NOS: 1-88 and conservative variations thereof.

38. The method of Claim 37, wherein the immunogenic HAV peptides comprise an amino acid sequence selected from the group consisting of SEQ ID NOS: 7, 8, 12, 16, 46, 72, 86, 87, and conservative variations thereof.

39. A method for detecting acute phase infection, comprising,

contacting one or more isolated, immunogenic HAV peptides with antibodies from mammalian serum, and detecting IgM antibodies that bind to immunogenic peptides, wherein detection of the IgM antibodies indicates the presence of HAV.

40. The method of Claim 39, wherein the immunogenic HAV peptides comprise an amino acid sequence selected from the group consisting of SEQ ID NOS: 1-88 and conservative variations thereof.

41. The method of Claim 40, wherein the immunogenic HAV peptides comprise an amino acid sequence selected from the group consisting of SEQ ID NOS: 7, 8, 12, 16, 46, 72, 86, 87, and conservative variations thereof.

42. The method of Claim 39, wherein the IgM antibody is recognized by a labeled secondary antibody.

43. A method for detecting convalescence in a mammal, comprising,

contacting one or more isolated, immunogenic HAV peptides with antibodies from mammalian serum, and detecting total antibody titer by measuring binding to immunogenic peptides.

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